MetaAnalysis – Systematic Review
Potential PURL Review Form
PURL Jam Version

PURLs Surveillance System
Family Physicians Inquiries Network

SECTION 1: Identifying Information for Nominated Potential PURL
[to be completed by PURLs Project Manager]

A. Citation: Wang RC, Smith-Bindman R, Whitaker E, Neilson J, Allen IE, Stoller ML, Fahimi J. Effect of Tamsulosin on Stone Passage for Ureteral Stones: A Systematic Review and Meta-analysis. Ann Emerg Med. 2017 Mar;69(3):353-361.e3. doi: 10.1016/j.annemergmed.2016.06.044. Epub 2016 Sep 8. Review. PubMed PMID: 27616037.
B. Link to PDF of full article: https://www.ncbi.nlm.nih.gov/pubmed/?term=27616037
C. First date published study available to readers:9/8/2016
D. PubMed ID: 27616037
E. Nominated By: Jim Stevermer
F. Institutional Affiliation of Nominator: University of Missouri
G. Date Nominated: 10/18/2016
H. Identified Through: POEMs
I. PURLs Editor Reviewing Nominated Potential PURL: Corey Lyon
J. Nomination Decision Date: 10/26/2016
K. Potential PURL Review Form (PPRF) Type: Systematic Review
L. Assigned Potential PURL Reviewer: David Moss
M. Reviewer Affiliation: Nellis Air Force Base
A. Abstract: STUDY OBJECTIVE:
Tamsulosin is recommended for patients receiving a diagnosis of a ureteral stone less than 10 mm who do not require immediate urologic intervention. Because of conflicting results from recent meta-analyses and large randomized controlled trials, the efficacy of tamsulosin is unclear. We perform a systematic review and meta-analysis to investigate the effect of tamsulosin on stone passage in patients receiving a diagnosis of ureteral stone.
METHODS:
MEDLINE, EMBASE, and CENTRAL databases were searched without language restriction through November 2015 for studies assessing the efficacy of tamsulosin and using a double-blind, randomized, controlled trial design. Meta-analysis was conducted with a random-effects model and subgroup analyses were conducted to determine sources of heterogeneity.
RESULTS:
Eight randomized controlled trials (N=1,384) contained sufficient information for inclusion. The pooled risk of stone passage in the tamsulosin arm was 85% versus 66% in the placebo arm, but substantial heterogeneity existed across trials (I2=80.2%; P<.001). After stratifying of studies by stone size, the meta-analysis of the large stone subgroup (5 to 10 mm; N=514) indicated a benefit of tamsulosin (risk difference=22%; 95% confidence interval 12% to 33%; number needed to treat=5). The meta-analysis of the small stone subgroup (<4 to 5 mm; N=533) indicated no benefit (risk difference=-0.3%; 95% confidence interval -4% to 3%). Neither meta-analysis for the occurrence of dizziness or hypotension showed a significant effect.
CONCLUSION:
Tamsulosin significantly improves stone passage in patients with larger stones, whereas the

effect of tamsulosin is diminished in those with smaller stones, who are likely to pass their stone regardless of treatment.

B. Pending PURL Review Date**:** 5/11/2017

SECTION 2: Critical Appraisal of Validity
[to be completed by the Potential PURL Reviewer]

A. What types of studies are included in this review? Randomized, double-blind, placebo controlled trials

B. What is the key question addressed by this review? Whether benefit of tamsulosin for ureteral stone passage is size dependent. Tamsulosin is beneficial for larger (5-10mm) ureteral stone passage but no significant change in passage rate for stones <4-5mm in size.

C. Study addresses an appropriate and clearly focused question. Well covered
Comments: Goal of this investigation was to determine if stone size modified the effect of tamsulosin on stone passage and to help identify why there is heterogeneity in current literature.

D. A description of the methodology used is included. Well covered
Comments: Medical literature databases were searched to include articles from 1966 to Nov 2015 limited to human subjects and regardless of language. Further review of bibliographies and consultation with topic experts were conducted to ensure no relevant articles were missed from the database search.

E. The literature is sufficiently rigorous to identify all the relevant studies. Well covered
Comments: Only randomized, double-blind, placebo controlled studies, that reported data that allowed for pooling were included.

F. Study quality is assessed and taken into account. Adequately addressed
Comments: Two independent reviewers determined if studies met inclusion criteria.

G. There are enough similarities between selected studies to make combining them reasonable. Adequately addressed
Comments: Discussed different diagnosis and passage definitions. Some studies used a cut off of 4mm and other used 5mm for large stones.

H. Are patient oriented outcomes included? If yes, what are they? No – stone passage.

I. Are adverse effects addressed? If so, how would they affect recommendations? Yes, to include postural hypotension and dizziness, which were not significantly increased in the tamsulosin treatment group.

J. Is funding a potential source of bias? If yes, what measures (if any) were taken to ensure scientific integrity? No, this study was funded by an Agency for Healthcare Research and Quality grant and authors stated they had no other commercial, financial, or other relationships related to the subject of the article.

K. To which patients might the findings apply? Include patients in the metaanalysis and other patients to whom the findings may be generalized.
Adults with distal ureteral stones not requiring urgent urologic intervention.

L. In what care settings might the findings apply, or not apply? Emergency departments, urgent care, primary care clinics, and inpatient units.

M. To which clinicians or policy makers might the findings be relevant? Emergency, Internal, and Family medicine providers.

SECTION 3: Review of Secondary Literature
[to be completed by the Potential PURL Reviewer]
[to be revised by the Pending PURL Reviewer as needed]

Citation Instructions: For up-to-date citations, use style modified from http://www.uptodate.com/home/help/faq/using_UTD/index.html#cite & AMA style. Always use Basow DS on editor & current year as publication year.

Example: Auth I. Title of article. {insert author name if given, & search terms or title.} In: Basow DS, ed. UpToDate [database online]. Waltham, Mass: UpToDate; 2009. Available at: http://www.uptodate.com. {Insert date modified if given.} Accesses February 12, 2009. [whatever date PPRF reviewer did their search.}

For DynaMed, use the following style:
Depression: treatment {insert search terms or title}. In: DynaMed [database online]. Available at http://www.DynamicMedical.com. Last updated February 4, 2009. {Insert date modified if given.} Accessed June 5, 2009. {search date}

A. DynaMed excerpts

B. DynaMed citation

Nephrolithiasis: Treatment overview. Loughlin, KR. In: DynaMed [database online]. Available at http://www.DynamicMedical.com. Last updated: January 15, 2017. Accessed May 16, 2017.

C. Bottom line recommendation or summary of evidence from DynaMed (1-2 sentences)

Medications, alpha blockers or calcium channel blockers, may be offered to facilitate stone passage during an observation period for patients with newly diagnosed ureteral stones <10mm, if active removal is not indicated.

D. UpToDate excerpts

E. UpToDate citation:

Curhan, G., Aronson, M., Preminger, G. Diagnosis and acute management of suspected nephrolithiasis in adults. In: Basow DS, ed. UpToDate [Database online]. Waltham, Mass: UpToDate; 2017. Available at: https://www.uptodate.com. Last updated: 2015. Accessed May 16, 2017.

F. Bottom line recommendation or summary of evidence from UpToDate (1-2 sentences)

UpToDate recommends the use of tamsulosin 0.4mg po daily, for up to 4 weeks, to facilitate stone passage in patients with stones measuring ≤10mm in size.

G. Other excerpts (USPSTF; other guidelines; etc.)
American Urologic Association

H. Citations for other excerpts

Preminger GM, Tiselius HG, Assimos DG, et al. 2007 guideline for the management of ureteral calculi. J Urol 2007; 178:2418.

I. Bottom line recommendation or summary of evidence from Other Sources (1-2 sentences)

Medical therapy to facilitate stone passage may be offered for patients with newly diagnosed ureteral stones <10mm. Alpha blockers (Tamsulosin) are the preferred agent for medical expulsive therapy.

SECTION 4: Conclusions
[to be completed by the Potential PURL Reviewer]
[to be revised by the Pending PURL Reviewer as needed]

A. **Validity**: How well does the study minimize sources of internal bias and maximize internal validity? 2

B. If **A** was coded 4, 5, 6, or 7, please describe the potential bias and how it could affect the study results. Specifically, what is the likely direction in which potential sources of internal bias might affect the results?

C. **Relevance**: Are the results of study generalizable to and relevant to the health care needs of patients cared for by “full scope” family physicians? 2

D. If **C** was coded 4, 5, 6, or 7, please provide an explanation.

E. **Practice changing potential**: If the findings of the study are both valid and relevant, does the practice that would be based on these findings represent a change from current practice?
3

F. If **E** was coded as 1, 2, 3, or4, please describe the potential new practice recommendation. Please be specific about what should be done, the target patient population and the expected benefit.

Adult patients, without indication for immediate urologic intervention, with distal ureteral stones <4-5mm should may not benefit from tamsulosin given the high spontaneous rate of stone passage. However this study did not include time to stone passage, just rate of passage after a set period of time (average of 28 days). For patients with stones measuring 5-10mm tamsulosin should be prescribed to improve rate of stone expulsion.

G. **Applicability to a Family Medical Care Setting**:
Is the change in practice recommendation something that could be done in a medical care setting by a family physician (office, hospital, nursing home, etc.), such as a prescribing a medication, vitamin or herbal remedy; performing or ordering a diagnostic test; performing or referring for a procedure; advising, education or counseling a patient; or creating a system for implementing an intervention? 1 (definitely could be done in a medical care setting)

H. If **G** was coded as a 4, 5, 6, or 7, please explain.

I. **Immediacy of Implementation**:
Are there major barriers to immediate implementation? Would the cost or the potential for reimbursement prohibit implementation in most family medicine practices? Are there regulatory issues that prohibit implementation? Is the service, device, drug, or other essentials available on the market? 1 (definitely could be immediately applied)

J. If **I** was coded 4, 5, 6, or 7, please explain why.

K. **Clinically meaningful outcomes or patient oriented outcomes**:
Are the outcomes measured in the study clinically meaningful or patient oriented?
3

L. If **K** was coded 4, 5, 6, or 7 please explain why.

M. In your opinion, is this a pending PURL? 2

1. Valid: Strong internal scientific validity; the findings appear to be true.

2. Relevant: Relevant to the practice of family medicine.

3. Practice Changing: There is a specific identifiable new practice recommendation that is applicable to what family physicians do in medical care settings and seems different than current practice.

4. Applicability in medical setting.

5. Immediacy of implementation

N. Comments on your response for question M.

This provides strong evidence that tamsulosin improves rate of stone passage for ureteral stones measuring 5-10mm in size. This is relevant for family medicine providers both in inpatient, emergency care, and outpatient settings and is easily implemented. This study does not however investigate if time to stone passage is shorter with tamsulosin compared to placebo just that the rate of passage was not significantly different.